DRINKOVIC, Tadija

Respiratory insufficiency and prevention of cor pulmonale.
Tuberkuloza, Beogr. 12 no.1:114-119 '60.
(PULMONARY HEART DISEASE prev. & control)

DRINKOVIC, Tadija

Contribution to the etiology of pulmonary abscess. Tuberkuloza, Beogr. 12 no.2:154-160 '60.

1. Bolnica tbc pluca, Novi Marof
(LUNG ABSCESS etiol)

DRINKOVIC, Tadija

Experience with Trecator in the Novi Marof Pulmonary Tuberculosis Hospital. Tuberkuloza no.1:36-43 '62.

1. Bolnica za tuberkulozu Novi Marof, (direktor: prim. dr. T.Drinkovic).
(ETHIONAMIDE) (TUBERCULOSIS PULMONARY)

DRINKOVIC, Tadija

Left complex according to Furlan. Tuberkuloza no.1:39-43 '62.

1. Bolnica za tuberkulozu Novi Marof, (dir.: prim. dr. T. Drinkovic).
(TUBERCULOSIS PULMONARY) (ATELECTASIS)

CZEIZEL, Endre, dr.; VACZO, Gyorgy, dr.; KERTAI, Pal, dr.; Technikai munkatars: DRINOCZY, Alajos

On the problem of radiotoxins. Magy. radiol. 15 no.6:356-360 N '63.

1. Orszagos Kozegeszsegugyi Intezet, Korelettani Osztaly es Fovarosi Istvan Korhaz, Rontgen Osztaly kozlemenye.
(RADIATION INJURY, EXPERIMENTAL)
(LIVER FUNCTION) (ERYTHROCYTES)
(LEUKOCYTES) (BLOOD) (MUSCLE)

KERTAI, P.; unter technischer Assistens von SZUCHOVSZKY, I.; DRINOCZY, A.

A study of the effect of the nervous system in colloid leukopenia and leukocytosis. Acta med.hung. 17 no.1:77-83 '61.

1. Staatliches Institut fur Hygiene, Budapest.
(LEUKOCYTOSIS physiol.) (LEUKOPENIA physiol.)
(NERVOUS SYSTEM physiol.)

N. SULYOK, Sara; KERTAI, Pal; technikai munkatarsak: PALLA, Sandrone; DRINOCZY, Alajos

Studies on the effect of the nervous system in colloidal leukopenia and leukocytosis. Kiserl. orvostud. 14 no.3:287-292 Je '62.

1. Orszagos Kozegeszsegugyi Intezet, Budapest.
(NERVOUS SYSTEM physiol) (LEUKOPENIA)
(LEUKOCYTOSIS)

KERTAI, P.; FORIS, G.; VUKAN-SAJGO, K.; unter technischer Mitarbeit von: PALLA-SZUCHOVSZKY, I.; DRINOCZY, L.

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1. Pathophysiologische abteilung des staatlichen hygienischen instituts, Budapest.

(LEUKOPENIA exper) (LEUKOCYTOSIS exper)
(PARABIOSIS)

CZEIZEL, Endre, dr.; VACZO, Gyorgy, dr.; KERTAI, Pal, dr.; Technikai munkatars: DRINOCZY, Lajos

The effect of the bone marrow on liver regeneration in normal and x-irradiated rats. Magy. radiol. 14 no.2:113-117 Mr '62.

1. Orszagos Kozegeszsegugyi Intezet es Fovarosi Istvan Korhaz Rontgenosztalya.

(BONE MARROW transpl) (RADIATION INJURY exper)
(LIVER physiol) (REGENERATION)

DRINOV, A.D.; KOZYRSKIY, G.Ya.; OKRAINETS, P.N.

High-accuracy contactless temperature regulator. Sbor. nauch. rab. Inst. metallofiz. AN URSR no.17:193-198 '63.

Method of the control of the creep of high pressure steam pipes during their use. Ibid.:199-208 (MIRA 17:3)

DRISCU, N., ing.

Thermal consolidation of loess. Rev cailor fer 10 no.1:10-15 Ja '62.

1. Serviciul constructii, Iasi.

DRISHEL, Khans; BOICHINOVA, Zdr. [translator]

Importance of the cyvernetic model of a self-regulating circle for biology. Biol i khim 6 no.6:1-6 '63.

1. Chlen na Redaktsionnata kolegiia, "Biologiia i khimiia" (for Boichinova).

DRITIC, D.

TECHNOLOGY PERIODICALS

DRITIC, D. Plastic materials from polyesteric resins. p.3.
Vol. 13, no. 1/2, 1959.

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April 1959 Unclass.

DRITOV, L.A., inzh.; MOROZOV, Yu.F., inzh.

Thawing frozen ground with electric points. Transp. stroi. 11 no.1:22-24 Ja '61. (MIRA 14:1)
(Frozen ground) (Electric heating)

DRITOV, L.A., inzh.; KALYAZHNOV, V.A., inzh.; GOL'DSHTEYN, M.Ye.

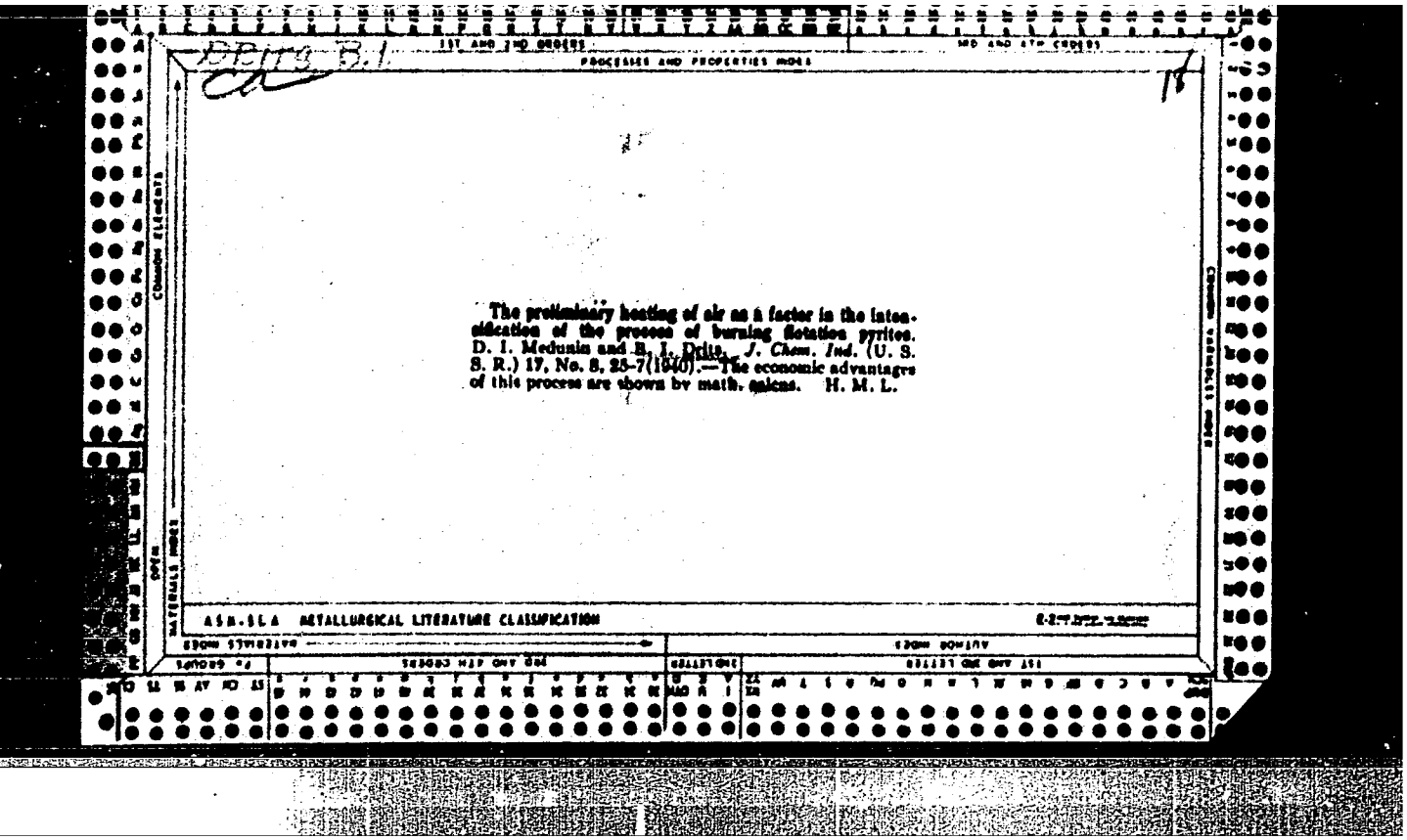
Parallel operation of mercury-arc rectifier units with and without commutator devices. Prom.energ. 17 no.10:15-18 O '62. (MIRA 15:9)

(Mercury-arc rectifiers)

DRITOV, Leonid Aleksandrovich, dotsent; GOL'DSHTEYN, Mikhail Yefimovich, inzhener-issledovatel'

Analysis of the parallel operation of dynamically controlled mercury rectifiers with inductive current dividers. Izv. vys. ucheb. zav.; elektromekh. 6 no.9:1084-1092 '63. (MIRA 16:12)

1. Chelyabinskiy politekhnicheskiy institut.



The preliminary heating of air as a factor in the intensification of the process of burning flotation pyrites. D. I. Medunin and B. L. Drits. *J. Chem. Ind.* (U. S. S. R.) 17, No. 8, 25-7(1940).—The economic advantages of this process are shown by math. calcns. H. M. L.

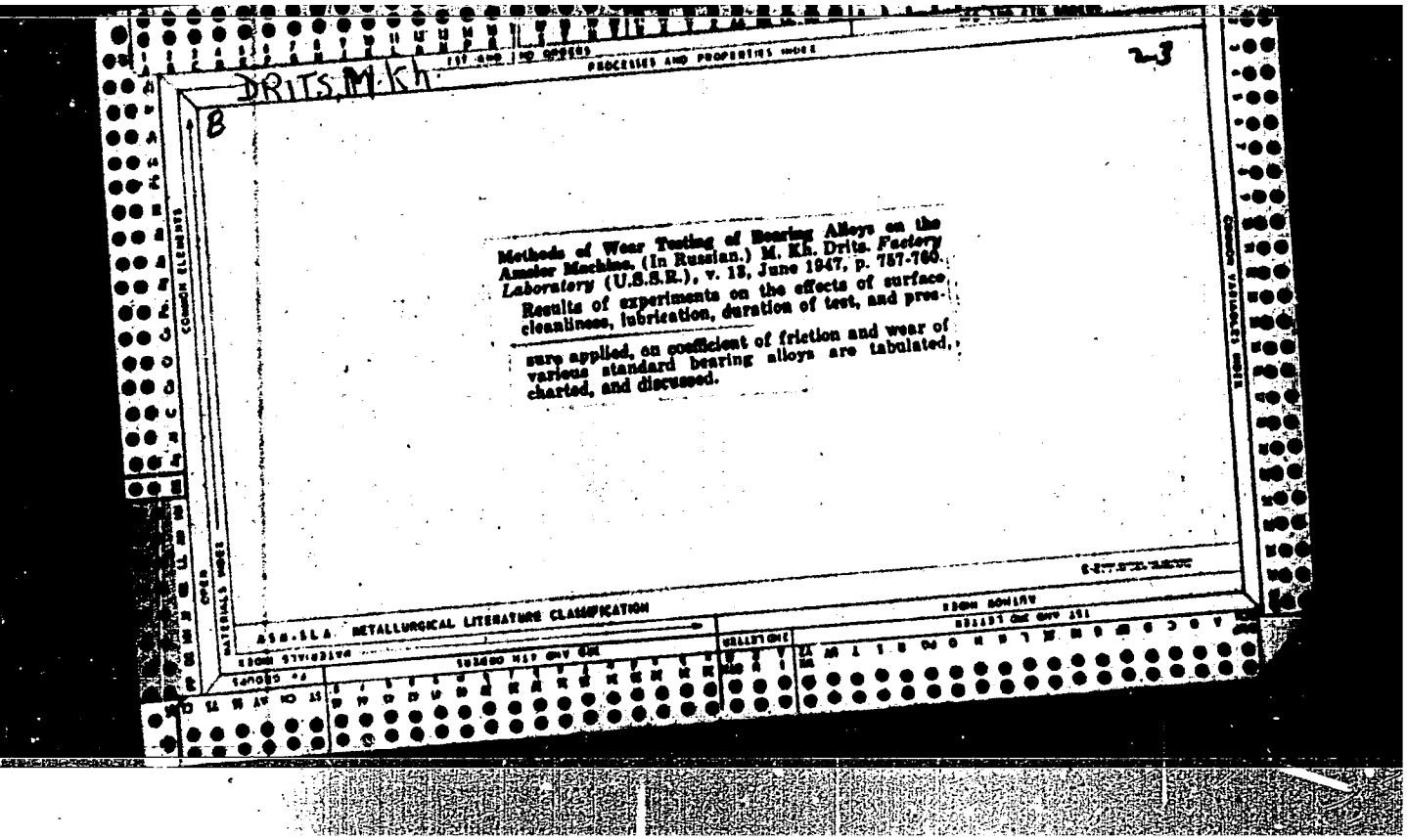
DONSKAYA, Ye.P.; KARATAYEVA, Ye.A.; BUDILINA, Yu.D.; GOROKHOVA, V.I.; DRITS, F.A.

M.A.Volkova; on her 60th birthday and the 35th anniversary of her medical service. Probl.tub. 36 no.1:124 '58. (MIRA 11:4)
(VOLKOVA, MARIIA ALEKSANDROVNA, 1897-)

VOLKOVA, M.A.; DRITS, F.A.; MISHINA, R.G.; GORBUNOVA, A.Ya.; KRAL'KO,Ye.A.

Dispensary examination without restriction for the detection of pulmonary tuberculosis. Prob. tub. no.1: 10-14 '63.
(MIRA 16:5)

1. Iz Irkutskogo oblastnogo protivotuberkuleznogo dispansera (glavnyy vrach - dotsent M.A. Volkova).
(TUBERCULOSIS-PREVENTION)


DRITS, M. Kh.

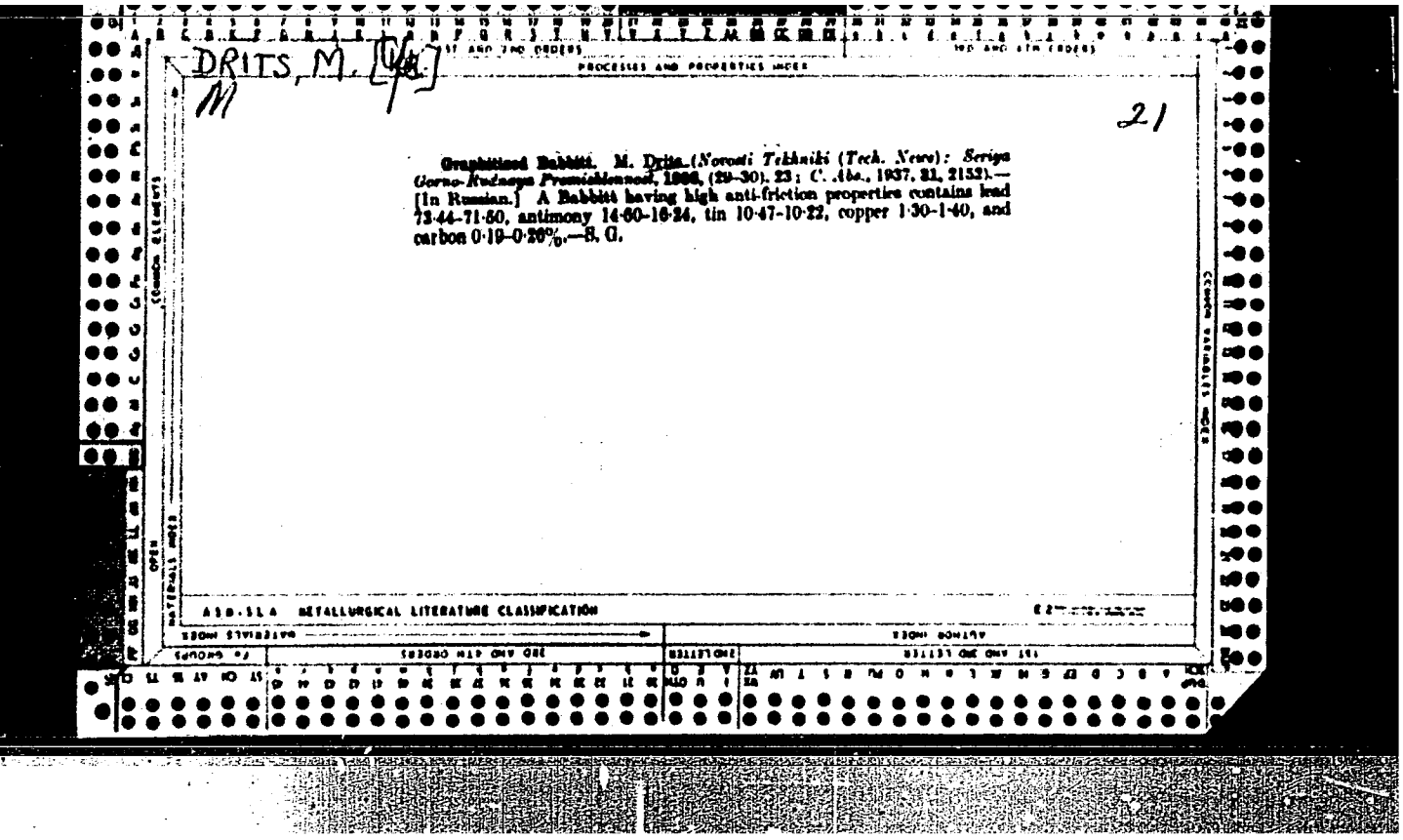
B

Methods of Wear Testing of Bearing Alloys on the Amsler Machine. (In Russian.) M. Kh. Drits. *Factory Laboratory* (U.S.S.R.), v. 13, June 1947, p. 757-760.

Results of experiments on the effects of surface cleanliness, lubrication, duration of test, and pressure applied, on coefficient of friction and wear of various standard bearing alloys are tabulated, charted, and discussed.

ASM-SLA METALLURGICAL LITERATURE CLASSIFICATION

DRITS, M. Kh. Doc Tech Sci -- "Study of the heat-resistance of magnesium alloys as a function of their composition and structure." Mos, 1961 (Min of Higher and Secondary Specialized Education RSFSR. Krasnoyarsk Inst of Nonferrous Metals im M. I. Kalinin). (KL, 4-61, 193)



DRITS, M. [illegible]

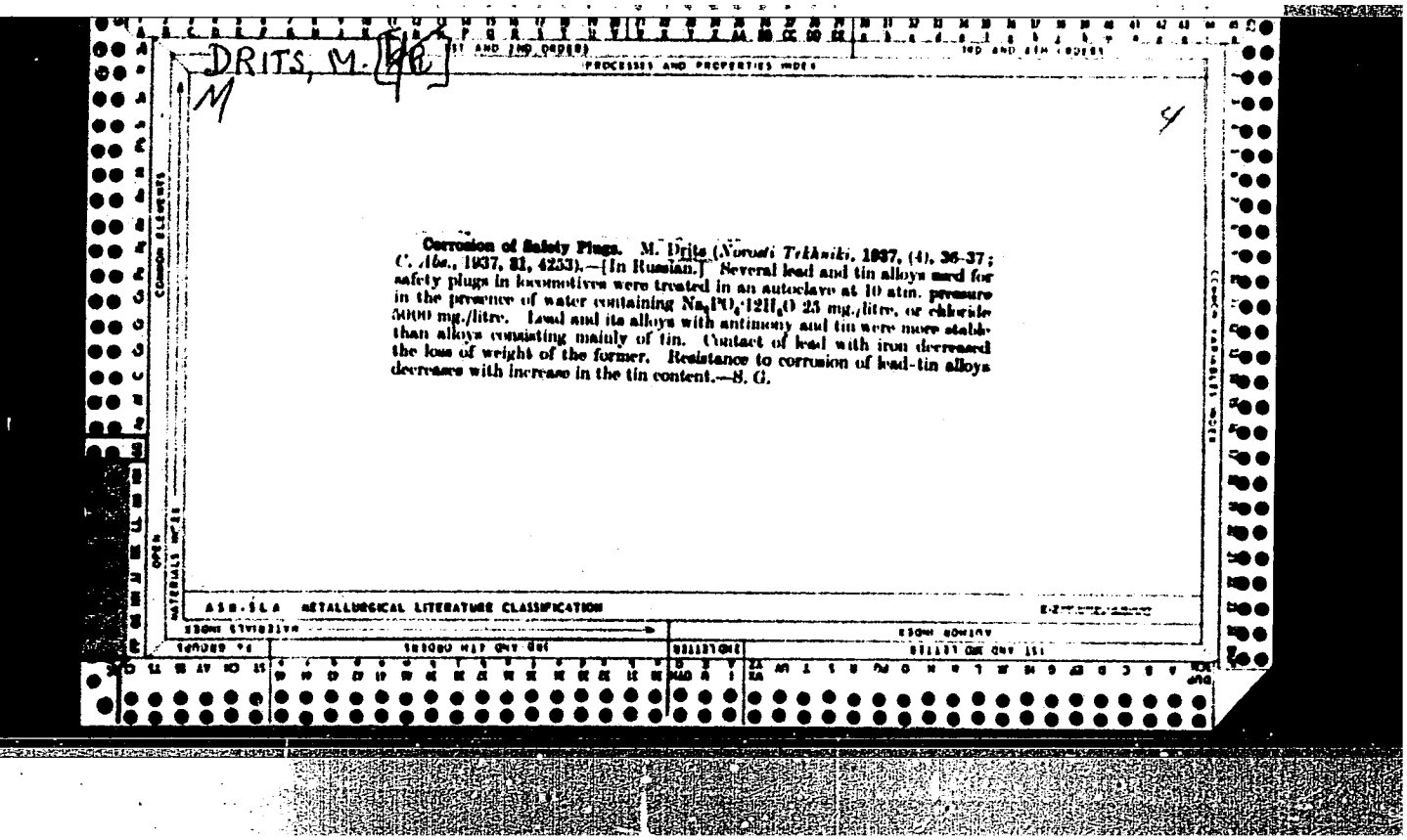
M

21

PROCESSES AND PROPERTIES INDEX

Graphitised Babbitt. M. Drits. (*Novosti Tekhniki* (*Tech. News*): *Seriya Gorno-Rudnaya Promishlennost*, 1936, (29-30), 23; *C. Abs.*, 1937, 31, 2153).—[In Russian.] A Babbitt having high anti-friction properties contains lead 73·44-71·60, antimony 14·60-16·24, tin 10·47-10·22, copper 1·30-1·40, and carbon 0·19-0·20%.—S. C.

A.S.M. METALLURGICAL LITERATURE CLASSIFICATION



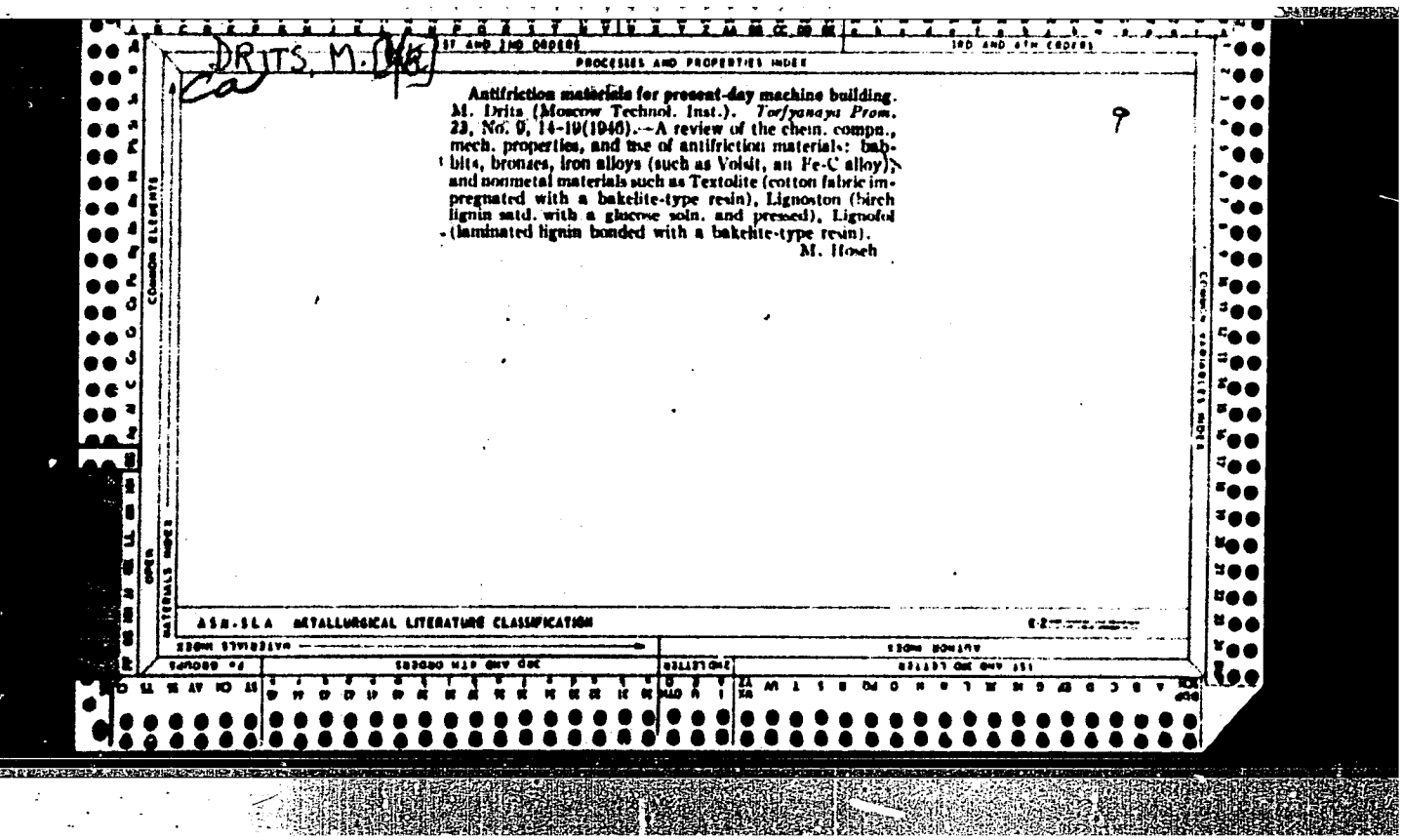
DRITS, M. [illegible]

M

4

Corrosion of Safety Plugs. M. Drits (*Vestnik Tekhniki*, 1937, (4), 36–37; *C. Abs.*, 1937, **31**, 4253).—[In Russian.] Several lead and tin alloys used for safety plugs in locomotives were treated in an autoclave at 10 atm. pressure in the presence of water containing $Na_3PO_4 \cdot 12H_2O$ 25 mg./litre, or chloride 5000 mg./litre. Lead and its alloys with antimony and tin were more stable than alloys consisting mainly of tin. Contact of lead with iron decreased the loss of weight of the former. Resistance to corrosion of lead-tin alloys decreases with increase in the tin content.—S. G.

A.S.M.-S.L.A. METALLURGICAL LITERATURE CLASSIFICATION



DRITS, M. [illegible]

Ca

PROCESSES AND PROPERTIES INDEX

Antifriction materials for present-day machine building. M. Drits (Moscow Technol. Inst.). *Torfyanaya Prom.* 23, No. 9, 14-19(1946).—A review of the chem. compn., mech. properties, and use of antifriction materials: babbits, bronzes, iron alloys (such as Voldt, an Fe-C alloy); and nonmetal materials such as Textolite (cotton fabric impregnated with a bakelite-type resin), Lignoston (birch lignin satd. with a glucose soln. and pressed), Lignofol (laminated lignin bonded with a bakelite-type resin).

M. Hosch

9

ASM-SLA METALLURGICAL LITERATURE CLASSIFICATION

PA 45/49T96

USSR/Metals
Wetting
Alloys

Mar 49

"Problem of Wetting Metals and Bearing Alloys," [redacted]. Ye. Drits, Inst of Metal imeni A. A. Baykov, Acad Sci USSR, 4 pp

"Iz Ak Nauk SSSR, Otdel Tekh Nauk" No 3

Tests showed that maximum angle of wetting depends on nature of metal, nature of surface, viscosity of lubricant, time, and temperature. Established that: (1) metals are wetted to various degrees by lubricants; (2) maximum angle

[redacted]

45/49T96

USSR/Metals (Contd) Mar 49

of wetting is greater for polished metal surfaces than on a rough surface; and (3) a drop of lubricant will flow slower on a rough surface than on a polished surface. Submitted by Acad A. A. Bochvar, 15 Sep 48.

[redacted]

45/49T96

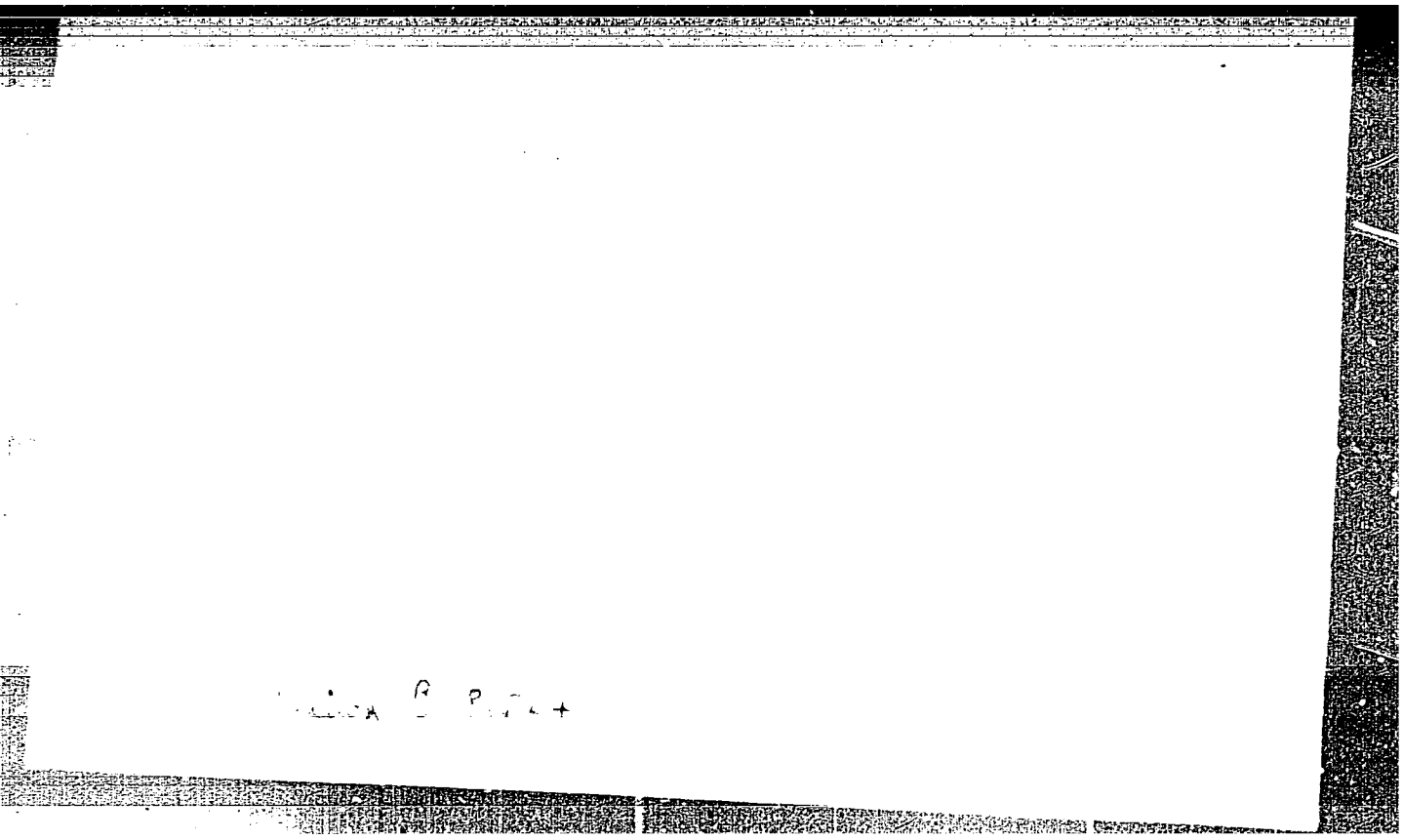
DRITS, M.Ye

"The dependence of macro-end micro-hardness on the composition for metallic systems, which are included in the composition of babbitt"

pp. 141 of the monograph "Microhardness", Acad. Sci. U.S.S.R., 1951

DRITS, M.Ye.

Effect of grain size, temperature and duration of the test on the microhardness of structural elements in standard bearing alloys. Tren.i izn.mash. no.7: 151-163 '53. (MLRA 9:9)
(Bearings (Machinery)) (Babbit metal)



DRITS, Mikhail Yefimovich; MASTRYUKOV, Aleksandr Vasil'yevich, redaktor; GUSEV, Viktor Petrovich; CHALKUSH'YAN, L.F., redaktor; EL'KINA, E.M., tekhnicheskiy redaktor;

[Bearing alloys with a zinc foundation and their use in light industry] Podshipnikovye splavy na tsinkovoi osnove i ikh primenenie v legkoi promyshlennosti. Pod red. A.V.Mastriukova. Moskva, Gos.nauchno-tekhn.izd-vo Ministerstva promysh.tovarov shirokogo potrebleniia SSSR, 1955. 78 p. (MLRA 8:12)
(Alloys) (Bearings(Machinery))

DRITS, M.Ye., kandidat tekhnicheskikh nauk.

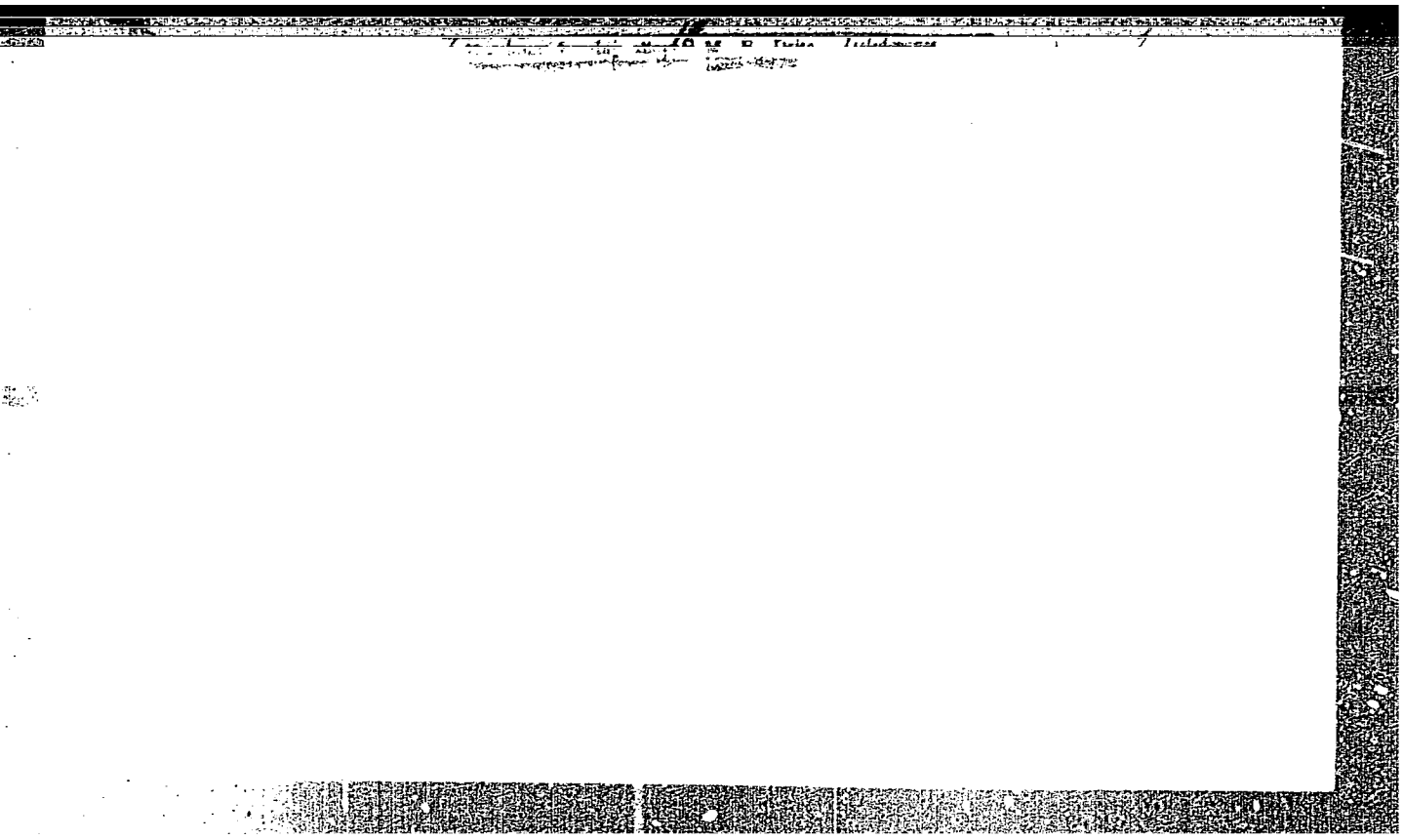
Professor A.M. Bochvar's studies in the field of white antifriction alloys. Issl. splav. tsvet. met. no.1:12-17 '55. (MLRA 9:10)

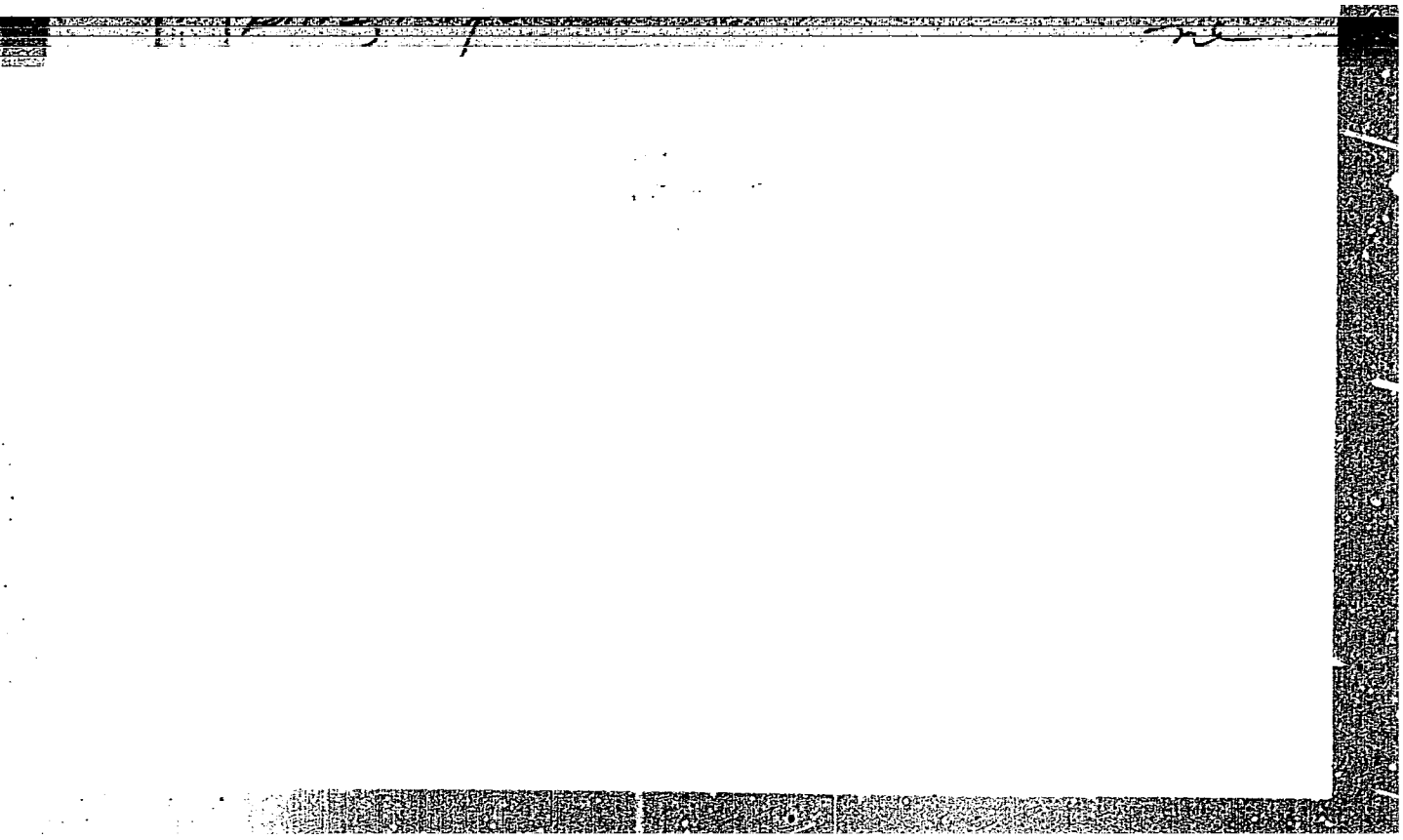
(Bearing metals)

DRITS, M.Ye., kandidat tekhnicheskikh nauk; DOKUKINA, N.V.

Problem of creep in bearing alloys. Issl. splav. tsvet. met. no.1: 71-80 '55. (MLRA 9:10)

(Bearing metals) (Creep of metals) (Babbitt metal)





APPROVED FOR RELEASE: Thursday, July 27, 2000 CIA-RDP86-00513R00041121(

DRITS, M.YE.

Category : USSR/Solid State Physics - Phase Transformation in Solid Bodies E-5

Abs Jour : Ref Zhur - Fizika, No 2, 1957 No 3843

Author : Drits, M.Ye., Sviderskaya, Z.A., Kadaner, E.S.
Title : Investigation of the Structure of Magnesium Alloys Containing Calcium, Using Radiographic Methods

Orig Pub : Issledovaniya po zharoprochnym splavam. M., AN SSSR, 1956, 84-90

Abstract : Using Ca^{45} (2-3 millicurie/kg of alloy), a radiographic investigation was made on the macro and micro structures of the following alloys: Mg-Ca, Mg-Mn-Ca, Mg-Mn-Al-Ca. The macrostructure of the alloys, exhibited after an exposure of 5-6 days on "XX" x-ray film, indicates that the crystallization has a dendrite character. Increasing the Ca content increases the irregularity of its distribution in the alloy. The microstructure was investigated using specimens 100-200 microns thick with the aid of MR nuclear plates after 10-15 days' exposure. Magnifications (up to x750) were obtained with a metallographic microscope using transmitted light. The calcium in the Mg-Ca alloys is concentrated in the interaxial space. Casting the alloys in a heated metallic mold gives a more uniform distribution of the calcium, than casting in sand. An investigation of the

Card : 1/2

Category : USSR/Solid State Physics - Phase Transformation in Solid Bodies E-5

Abs Jour : Ref Zhur - Fizika, No 2, 1957 No 3843

dendrite structure in various kinds of heat treatments has disclosed optimum conditions for homogenization of triple and quadruple alloys, the diagrams of which are unknown. It is shown that annealin g at 600° for 24 hours removes the texture of a hot-rolled alloy.

INST. METALLURGY IM. A.A. BAYKOV.

Card : 2/2

137-58-6-13594

Translation from: Referativnyy zhurnal, Metallurgiya, 1958, Nr 6, p 344 (USSR)

AUTHOR: Drits, M.Ye., Moguchiy, L.N.

TITLE: Mechanical Properties of the MA9 Alloy Under Deformation at Elevated Temperatures (Mekhanicheskiye svoystva deformirovannogo splava MA9 pri povyshennykh temperaturakh)

PERIODICAL: V sb.: Prochnost' metallov. Moscow, AN SSSR, 1956, pp 190-198

ABSTRACT: The mechanical properties of the Mg alloy (A) MA9 were tested under static and dynamic tensile stresses, by means of upsetting the A under a vertical drop hammer and for a_k. It was demonstrated that the A lends itself well to pressure forming. At small rates of deformation, the maximal ductility of the A lies in the range of 350-450°C, whereas at higher rates of deformation the zone of maximal plasticity is displaced toward the 450-500° interval. On the strength of a comparison of the mechanical properties of A's, it is concluded that, at 200°, the strength characteristics of the A investigated are better than those of the A's MA5 and MA7. Despite its somewhat lower ductility, the A is readily deformable at temperatures between 400° and 475°. 1. Magnesium alloys--Mechanical properties 2. Magnesium alloys--Deformation 3. Magnesium--Temperature factors

I.N.

Card 1/1

BELOV, A.F., inzhener; DRITS, M.Ye., kandidat tekhnicheskikh nauk.

Light alloys and their significance for technological progress.
Vest. AN SSSR 26 no.9:21-26 S '56. (MLRA 9:11)
(Alloys)

DRITS, M.Ye.

Effect of the roughness of surfaces on their wear and the friction coefficient. Trudy Sem. po kach. poverkh. no.1:61-68 '57.
(Surfaces (Technology)) (MLRA 10:8)
(Mechanical wear)

SVIDERSKAYA, Z.A.; DRITS, M.Ye.; KADANER, E.S.

Use of radioactive isotopes in studying microheterogeneity of magnesium alloys. Trudy Inst.met.AN SSSR no.1:249-257 '57.
(MIRA 10:11)
(Magnesium alloys) (Radioisotopes)

DRITS, M. Ye

137-58-3-6054

Translation from: Referativnyy zhurnal, Metallurgiya, 1958, Nr 3, p 231 (USSR)

AUTHORS: Drits, M. Ye., Fridlyander, I. N.

TITLE: All-Union Conference on Light Alloys (Vsesoyuznaya konferentsiya po legkim splavam)

PERIODICAL: Tr. In-ta metallurgii. AN SSSR, 1957, Nr 2, pp 224-229

ABSTRACT: Called by the Institute of Metallurgy of the Acad. of Sciences & the MAP of the USSR, the 1955 all-union conference on light alloys summarized the results of the work of the industry and of the scientific research institutes with regard to the production, processing, and employment of light alloys in the national economy. The following topics were discussed at the conference: 1) the study of the requirements relative to light alloys and products made thereof as dictated by modern engineering processes; 2) exploration of novel alloys and perfection of heat treatment procedures; 3) the present state and prospects for the future development of blank and profiled casting; 4) present state and prospects for the future development of press working of light alloys. A brief survey of major reports presented at the conference is given.

Card 1/1

E. K.

DRITS, M.Ye.

AUTHORS: Sviderskaya, Z.A., Drits, M.Ye., Candidates of Tech. Sc. and Kadaner, E.S., Ing. (Institute of Metallurgy, Ac.Sc. U.S.S.R. imeni A.A. Baykov).

TITLE: Influence of the speed of crystallisation on the micro non-uniformity of magnesium alloys. (Vliyaniye skorosti kristallizatsii na mikroneodnorodnost' magniyevykh splavov).

PERIODICAL: "Metallovedenie i Obrabotka Metallov" (Metallurgy and Metal Treatment), 1957, No.5, pp.23-29 (U.S.S.R.)

ABSTRACT: The structural micro non-uniformity of calcium containing magnesium alloys was investigated by using radioactive calcium and for establishing the relation between the speed of cooling of magnesium alloys and the intradendritic liquations, the method of quantitative autoradiography was utilised, which is based on determining the contents of the individual elements in the micro-volume of the alloy by photometering of radio-autographic exposures (11, 12). Characteristic curves were preliminarily plotted which express the relation between the intensity of radioactive radiation and the blackness density of photo emulsions. By means of these curves the ranges of blackening were measured for which there is a direct relation between the density of blackening and the

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concentrations of the radio-active calcium. The blackness density was measured at 500 points. The micro non-uniformities were studied on three series of castings for which a change in the speed of cooling was achieved by various methods; for one series binary magnesium and calcium alloys were cast into metal moulds which were pre-heated to various temperatures; the second and third series of castings consisted of quaternary magnesium-manganese-aluminium-calcium alloys for which a change in the cooling speed was achieved by using moulds of different materials or moulds of different cross sections. Fig.1 shows graphs of the blackness density for magnesium-calcium alloys; Fig.2 shows the distribution of the calcium for various cooling speeds; Fig.3 shows micro-radiograms of Mg-Mn-Al-Ca alloys cast into earthen moulds of various cross sections, whilst Fig.4 shows graphs of the dependence of the micro non-uniformities on the cooling speed. In the case of binary magnesium-calcium alloys, the curves do not pass through a maximum, i.e. the micro non-uniformity of the structure decreases continuously with increasing speed of cooling. Investigation of the microstructure of the investigated alloys indicates that in all cases the quantity of the

Influence of the speed of crystallisation on the micro non-uniformity of magnesium alloys. (Cont.)

second phase was very small and, therefore, from the point of view of the structure the studied alloys were near to single-phase solid solutions. The fact that the photometering of the micro-radiograms was carried out at relatively small magnifications and that the inclusions of the manganese component in Mg-Mn-Al-Ca alloys do not produce blackening on the micro-radiograms leads to the assumption that the derived relations reflect the character of the distribution of the calcium resulting from intra-crystallite liquations during crystallisation of the solid solution. The method of quantitative radiography permits not only evaluation of the scale of the observed micro non-uniformities during casting of Ca containing magnesium alloys but it also confirms experimentally the general character of the changes in the micro non-uniformity with changing cooling speeds. At an equal cooling speed various materials will have an inclination to a more or less developed dendritic crystallisation and this will obviously affect the micro non-uniformities which occur during solidification.. Change in the cooling speed will affect appreciably the heat resistance of the alloy. The highest ultimate strength will be obtained for medium cooling speeds, i.e. in the case of maximum heterogeneity of the cast alloy. 2 Tables, 4 Figures; 11 Russian and 1 English references.

DRITS, M. YE

24-6-3/24

AUTHORS: Drits, M. Ye., Kadaner, E.S., Sviderskaya, Z.A. and Shcherbinina, Ye. L. (Moscow).

TITLE: A study of the distribution of iron in aluminium using the method of autoradiography. (Izucheniye raspredeleniya zheleza v alyuminii metodom avtoradiografii).

PERIODICAL: "Izvestiya Akademii Nauk, Otdeleniye Tekhnicheskikh Nauk" (Bulletin of the Ac.Sc., Technical Sciences Section), 1957, No.6, pp.12-17 (U.S.S.R.)

ABSTRACT: Results are reported of an investigation into the distribution of iron in aluminium, and also its redistribution on heating. The method of quantitative autoradiography (4,5) has allowed an estimate to be made of the change in micro-nonuniformity in the structure of aluminium as the iron content is increased. The radio-isotope Fe^{59} was used in a 99.985% pure aluminium. Figs. 1 and 2 show microradiograms of various Al-Fe alloys. The blackened areas show the presence of iron. As can be seen, when very small amounts of iron are introduced, areas of different structural character are observed even in a given specimen (Fig.1a and б). Evidently, this is connected with the larger size of grains which are visible in the plane of the section. The iron is concentrated not only on the boundaries of the grains but

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A study of the distribution of iron in aluminium using the method of autoradiography. (Cont.)

also within them. The introduction of iron into aluminium in larger quantities (up to tenths of a percent) leads to a break up of the grains and appearance of a clear dendritic structure with iron distributed in the interaxial spaces (Fig.1B). Fig.2 shows (for comparison) the microstructure of the same specimens, shown up by the usual etching. There is a practically total absence of solid solutions in the system Al-Fe, but a separation of the compound $FeAl_3$ is observed in cast samples, beginning at thousandths of a percent. Two coefficients are defined:

$$K = (100-n)/100 \quad \text{and} \quad C = C_{max}/C_{min}$$

where n is the number of micro-volumes, per 100 measured micro-volumes, which have an iron concentration equal to the average iron concentration in the specimen; C is the ratio of the maximum to minimum concentrations of iron in separate micro-volumes in the region investigated. Photometric measurements were carried out using a micro-photometer having a square aperture of 1 mm^2 and a magnification of 24 times.

A study of the distribution of iron in aluminium using the method of autoradiography. (Cont.)

Fig.3 shows plots of the average number of cells (in %) versus iron concentration for three different mean concentrations (0.0085%, 0.19% and 0.74% Fe). Table 2 gives the values of K and C for various alloys, and a plot of K and C versus percentage of iron is given in Fig.4. Both K and C fall at first and then tend to reach a steady value. The "knee" of the C-curve corresponds to the change in the character of the distribution of iron in aluminium as can be seen by comparing Figs. 1B, 1a and 1б . The effect of prolonged heating at 605 C (up to 100 hours) is shown in Figs. 5 and 6. In Fig.5, K and C are plotted versus heating time in hours. Fig.6 shows microradiograms of Al + 0.194% Fe after heating at 605 C for 50 and 100 hours respectively. All the data indicate that the micro-nonuniformity in the distribution of iron in aluminium, which is produced during the process of crystallisation, is very stable and is not much affected by homogenizing treatment. The large size of the surfaces of division at which the evolution of the intermetallic compound $FeAl_3$ takes place produce favourable conditions for blocking sliding processes which develop as a result of plastic deformation and this apparently has a

A study of the distribution of iron in aluminium using the method of autoradiography. (Cont.)

favourable influence on the creep resistance of aluminium and aluminium alloys in presence of iron.
There are 6 figures, 3 tables and 6 references, 5 of which are Slavic.

SUBMITTED: February 26, 1957.

Card 4/4

D'YACHENKO, Petr Yefimovich, prof., doktor tekhn. nauk; DRITS, M.Ye., kand. tekhn. nauk, retsenzent; SHINYAYEV, A.Ya., kand. fiz.-mat. nauk, red.; BALANDIN, A.F., red. izd-va; SOKOLOVA, T.F., tekhn. red.

[Using radioactive isotopes in technology] Primenenie radioaktivnykh izotopov v tekhnike. Moskva, Gos. nauchno-tekhn. izd-vo mashinostroit. lit-ry, 1958. 214 p. (MIRA 12:2)
(Radioisotopes--Industrial applications)

DRITS, N. Ye.: SVIDERSKAYA, Z. A.; KADANER, E. S.: and VASHCHENKO, A. A.

"Magnesium Alloys for Performance at Elevated Temperatures"

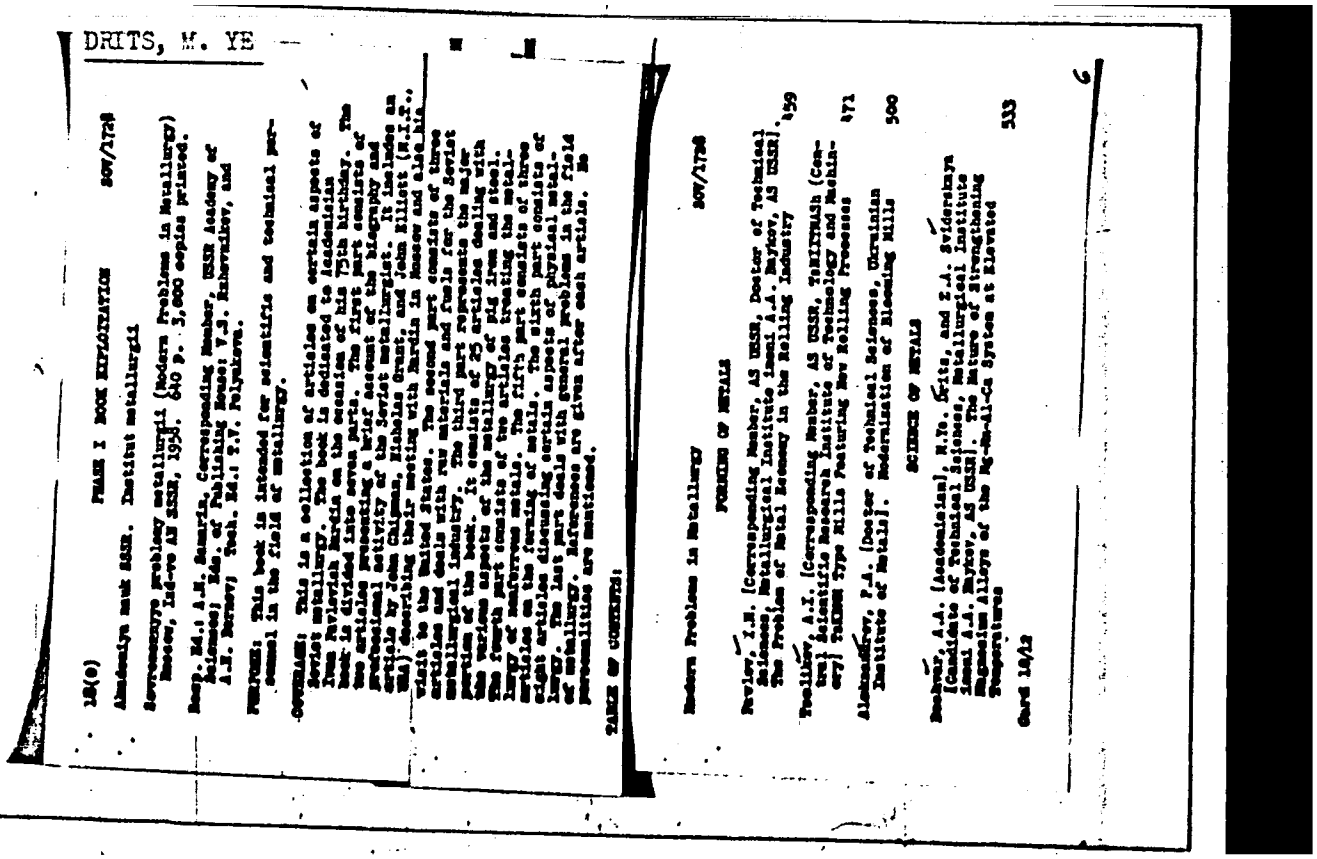
Light Alloys. no. 1: Physical Metallurgy, Heat Treatment, Casting, and Forming, Principal Reports of the Conference, Moscow, Izd-vo AN SSSR, 1958, 467 P.
(2nd All Conf. on Light Alloys, 1955)

DRITS, M.Ye.

FRIDLYANDER, I.N., kand.tekhn.nauk, otvetstvennyy red.; PETROV, D.A., doktor tekhn.nauk, prof., red.; BELOV, A.F., red.; DRITS, M.Ya., kand. tekhn.nauk, red.; LIVANOV, V.A., kand.tekhn.nauk, red.; SHAROV, M.V., kand.tekhn.nauk, red.; KORNEYEV, N.I., doktor tekhn.nauk, prof., red.; RZHEZNIKOV, V.S., red. izd-va; CHERNOV, A.N., red. izd-va.

[Light alloys] Legkie splavy. Moskva, Izd-vo Akad. nauk SSSR. No.1. [Physical metallurgy, heat treatment, founding, and use of pressure] Metallovedenie, termicheskaia obrabotka, lit'e i obrabotka davleniem. 1958. 497 p. (MIRA 11:6)

1. Vsesoyuznaya konferentsiya po legkim splavam. 2d, 1955. (Alloys)



DRITS, M. YE

SOV/1738

15(0) PHASE I BOOK EXPLOITATION

Akademiya nauk SSSR. Institut metallurgii

Severnoyemu problemy metallurgii (Modern Problems in Metallurgy) Moscow, Ind-vo AN SSSR, 1958. 240 p. 3,000 copies printed.

Resp. Ed.: A.A. Baykov, Corresponding Member, USSR Academy of Sciences; Eds. of Publishing House: V.S. Zaborovskiy, and A.F. Borzov; Tech. Ed.: P.V. Polyakova.

PURPOSE: This book is intended for scientific and technical personnel in the field of metallurgy.

COVERAGE: This is a collection of articles on certain aspects of Soviet metallurgy. The book is dedicated to Academician Ivan Petrovich Bardin on the occasion of his 75th birthday. The book is divided into seven parts. The first part consists of the articles presenting a brief account of the biography and professional activity of the Soviet metallurgist. It includes an article by John Chipman, Nobelia Grant, and John Elliott (M.I.T., Cambridge) describing their meeting with Bardin in Moscow and also his visit to the United States. The second part consists of three articles and deals with raw materials and fuels for the Soviet metallurgical industry. The third part represents the major portion of the book. It consists of 25 articles dealing with the various aspects of the metallurgy of pig iron and steel. The fourth part consists of the articles treating the metallurgy of nonferrous metals. The fifth part consists of three articles on the forming of metals. The sixth part consists of eight articles discussing certain aspects of physical metallurgy. The last part deals with general problems in the field of metallurgy. References are given after each article. No personalities are mentioned.

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Modern Problems in Metallurgy SOV/1738

FOREIGN OF METALS

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Bochkarev, A.I. (Corresponding Member, AS USSR, Tekhtmash (Central Scientific Research Institute of Technology and Mechanical Engineering)). Tandem Type Mills Featuring Low Rolling Pressures 471

Aleksandrov, P.A. (Doctor of Technical Sciences, Ukrainian Institute of Metals). Modernization of Blooming Mills 500

SCIENCE OF METALS

Bochvar, A.A. (Academician), N.Ye. Gritz, and Z.A. Sviridenkova (Candidate of Technical Sciences, Metallurgical Institute imeni A.A. Baykov, AS USSR). The Nature of Strengthening Magnesium Alloys of the Mg-Mn-Ce System at Elevated Temperatures 533

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SOV/137-58-9-20061

Translation from: Referativnyy zhurnal, Metallurgiya, 1958, Nr 9, p 279 (USSR)

AUTHORS: Drits, M.Ye., Sviderskaya, Z.A., Kadaner, E.S. Vashchenko, A.A.

TITLE: Magnesium Alloys for Work at Elevated Temperatures (Magniyevyye splavy dlya raboty pri povyshennykh temperaturakh)

PERIODICAL: V sb.: Legkiye splavy. Nr 1. Moscow, 1958, pp 147-156

ABSTRACT: MA9, a new Mg alloy (A) based on the Mg-Mn system, plus small additions of other elements, is developed. In heat resistance when cast, MA9 is superior to all the standard foundry A and the majority of A containing the rare elements. At room temperature, the mechanical properties of the cast A are below standard: σ_b 14-16 kg/mm^2, δ 4-6%. In the extruded condition, MA9 combines superior mechanical properties at room temperature: σ_b 30-32 kg/mm^2, σ_s 28-29 kg/mm^2, δ 7-8%, with adequate heat resistance σ^{200}_{100} 7-9 kg/mm^2 and σ^{250}_{100} 5 kg/mm^2. Pilot-plant tests of the properties of MA9 with semifinished products from

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Magnesium Alloys for Work at Elevated Temperatures

continuous-casting ingots show the minimum longitudinal values of σ_b for sheet 0.8-3.0 mm thick, and for extruded sections and rods, to be 26 kg/mm^2. The heat-resistance characteristics obtained at 200°C with specimens of extruded semifinished products are: σ_{100} 7-8 kg/mm^2, $\sigma_{0.2/100}$ 2.9 kg/mm^2, and at 250° σ_{100} 5 kg/mm^2, and $\sigma_{0.2/100}$ 1.7 kg/mm^2. Comparison of the properties of MA9 A with those of standard A (MA2, MA5, MA8, VM17, VM65-1) shows that at room temperature MA9 has higher strength characteristics than MA2, MA8, and VM17, and that at above 150° the strength of MA9 exceeds those of the above-indicated A. The advantage of MA9 alloy is manifested particularly in terms of $_s$, which at 150° is 65% higher than that of MA8. MA9 A contains no rare elements or elements in short supply, does not need heat treatment, is not subject to corrosion cracking under stress, and undergoes less oxidation in the molten state than do other Mg alloys. A characteristic peculiarity of MA9 A is the small level of softening which it undergoes after annealing. The good engineering properties of MA9 when subjected to pressworking make possible its use for a wide variety of semifinished products. The satisfactory mechanical properties of MA9 at room and elevated temperatures make it suitable for a wider range of uses in aircraft structures than other Mg A. E.K.

Card 2/2 1. Magnesium alloys--Thermodynamic properties 2. Heat resistant alloys--Development

DRITS, M. Ye.

AUTHORS: Drits, M.Ye, Kadaner, E.S. and Sviderskaya, Z.A.(Moscow) 24-2-20/28

TITLE: Influence of the micro non-uniformity of alloys on their behaviour at elevated temperatures. (Vliyaniye mikro-neodnorodnosti splavov na ikh povedeniye pri povyshennykh temperaturakh).

PERIODICAL: Izvestiya Akademii Nauk SSSR, Otdeleniye Tekhnicheskikh Nauk, 1958, No.2, pp. 139-142 (USSR).

ABSTRACT: Bochvar (Refs.1 and 2) has pointed out that hetero-genisation of the structure determined by the distribution and the shape of the separations of the hardening phases and insoluble admixtures are important for ensuring a high heat resistance of cast alloys. The authors made an attempt to investigate the influence of structural micro non-uniformities on certain properties of magnesium and, particularly, of aluminium alloys at elevated temperatures. In the given case the micro non-uniformity is understood to be the total non-uniformity in the distribution of one or another of the alloying elements and in the micro-volumes of the solid solution as well as in insoluble secondary crystallising phases. On the basis of results obtained with radio-active tracers and quantitative autoradiography, the degree of micro

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Influence of the micro non-uniformity of alloys on their behaviour at elevated temperatures.

non-uniformity of the alloys is characterised by two coefficients K and C which are calculated from the frequency distribution curve as described in an earlier paper of the authors (Ref.3). On the example of an alloy of the system Mg-Mn-Al-Ca the influence was investigated of distribution of Ca on the heat resistance and the ductility, since small additions of Ca have a great influence on the mechanical and the heat resistance characteristics of these alloys. The micro non-uniformity of the alloy was changed by changing the crystallisation speed during casting, using earth moulds of various cross sections. Radio-active calcium of a quantity of 2 to 3 mCu per kg was introduced. From the cast material specimens were produced for testing the long duration strength and the impact strength at 250°C. A quantitative evaluation of the micro non-uniformity and the relations governing the changes in the micro-non-uniformity with varying crystallisation speeds was made in earlier work of the author (Ref.3) for the same alloy under similar casting conditions. In the case under consideration, the Ca content amounted to 0.22%

Influence of the micro non-uniformity of alloys on their behaviour at elevated temperatures.

and the micro non-uniformity represented the non-uniform distribution of the Ca in the micro-volumes of the solid solution since the quantity of the second phase was very low and was detected microscopically only at magnifications of 800 to 1000 times. The results of these experiments are entered in Table 1 and graphed in Fig.1 (micro non-uniformity coefficients K and C, long duration strength σ_{100} kg/mm^2, impact strength kgm/cm^2 as functions of the crystallisation speed during solidification, °C/min). The results of experiments aimed at determining the influence on the heat resistance of the redistribution of Ca in the structure caused by various conditions of deformation are entered in Table 2 and graphed in Fig.3 for reductions (by pressing) of 52, 76 and 86%. It can be seen that the change in the heat resistance under the influence of deformation is linked with the change of the micro non-uniformities; with increasing reductions the dendritic structure will be disrupted and the components of the alloy will be broken up into finer particles which leads to an intensification of the creep processes. Since the stability

Influence of the micro non-uniformity of alloys on their behaviour at elevated temperatures.

of the properties of cast alloys at elevated temperatures depends to some extent on the stability of the initial structure, the authors compared the structural changes taking place under the influence of heating with the heat resistance of binary alloys of aluminium with iron and of magnesium with Ca. The results of these tests are entered in Table 3 and graphed in Fig.5. There are 5 figures, 3 tables and 4 references, all of which are Russian.

SUBMITTED: July 11, 1957.

AVAILABLE: Library of Congress.

Card 4/4

DRITS, M.Ye.; SVIDERSKAYA, Z.A.; KADANER, E.S.

Effect of the distribution of alloying elements on the behavior of alloys at high temperatures. Issl. po zharopr. splav. 3:303-309 '58. (MIRA 11:11)
(Alloys--Metallography) (Metals at high temperatures)

SOV/24-58-5-22/31

AUTHORS: [redacted]daner, E. S. and Sviderskaya, Z. A. (Moscow)

TITLE: Variation of Micro-Heterogeneity of Alloys in Relation to the Character of the Interaction Between Their Components (Izmeneniye mikroneodnorodnosti splavov v svyazi s kharakterom vzaimodeystviya komponentov)

PERIODICAL: Izvestiya Akademii Nauk SSSR, Otdeleniye Tekhnicheskikh Nauk, 1958, Nr 5, pp 120-124 (USSR)

ABSTRACT: The effect of composition on the degree of micro-heterogeneity in the Al-Fe, Al-Zn, Mg-Ca and Mg-Zn alloys was investigated by the radioactive tracer technique. Only the Al- and Mg-rich alloys with less than 0.74% of the alloying element were studied, particular attention being paid to maintaining a constant rate of cooling through the crystallisation range when the experimental ingots were prepared. The degree of heterogeneity was expressed in terms of two coefficients : Coefficient K - indicating the total number of deviations from the nominal composition, and coefficient C - measuring the maximum deviation from the nominal composition of the alloy. The results (tabulated and reproduced in the form of graphs showing the variation of K and C with the composition) were correlated with the corresponding portions of the

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Variation of Micro-Heterogeneity of Alloys in Relation to the Character of the Interaction Between Their Components

equilibrium diagrams of the investigated systems and with the microstructure of the studied alloys. It is shown that:
(1) The absolute values of K and C are higher for systems whose components are mutually insoluble in the solid state (Al-Fe) than for those which form series of solid solutions.
(2) When the solidification range of the alloys changes slowly with the changing composition (Al-Fe, Al-Zn systems) K and C remain practically constant.
(3) The variation of K and C is most complex in systems with a limited solid solubility range, particularly if the solidification range increases rapidly with the rising content of the alloying element (e.g. Mg-Ca system). The K, C/composition curves for such systems pass through a maximum at a composition at which the proportion of the second phase present in the alloy reaches a certain minimum value. This indicates that in the two-phase regions of compositions micro-heterogeneity is determined mainly by the manner in which the second phase is

Variation of Micro-Heterogeneity of Alloys in Relation to the Character of the Interaction Between Their Components

distributed, while in the single-phase regions the segregation within the solid solution grains plays the most important part.
There are 5 figures, 1 table and 6 references, 3 of which are Soviet, 3 English.

ASSOCIATION: Institut metallurgii im. A. A. Baykova AN SSSR (Metallurgy Institute imeni A. A. Baykov, Ac.Sc. USSR)

SUBMITTED: October 21, 1957

Card 3/3

SOV/24-58-8-16/37

AUTHORS: Drits, M. Ye., Mal'tsev, M. V., Padezhnova, Ye. M. and Sviderskaya, Z. A. (Moscow)

TITLE: Influence of Thorium on the Heat Resistance of Magnesium and Some of its Alloys (Vliyaniye toriya na zharoprochnost' magniya i nekotorykh ego splavov)

PERIODICAL: Izvestiya Akademii Nauk SSSR, Otdeleniye Tekhnicheskikh Nauk, 1958, Nr 8, pp 93-97 (USSR)

ABSTRACT: According to published Western data (Refs.1-3), magnesium alloys with additions of 2 to 3% thorium have a high creep stability in the temperature range 300 to 350°C and satisfactory mechanical and technological properties. The authors of this paper applied the method of investigation of the short duration and the long duration hardness for the binary alloys of magnesium and thorium and for certain ternary alloys containing in addition to thorium, Ce, Mn, Al, Ca and Zn. The results of the hardness measurements of the binary alloys of magnesium and thorium in the as-cast state and after stabilisation at 300°C are entered in Table 1. The hardness values are entered in Table 2 for the same specimens after quenching in water at 565°C, at which temperature the specimens were

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Influence of Thorium on the Heat Resistance of Magnesium and Some of its Alloys

held for sixteen hours; heating of the specimens was effected in quartz glass ampules from which air was evacuated and which were filled with sulphur powder. The influence of thorium on the hardness of the binary Mg-Th alloys at room and elevated temperatures is graphed in Fig.1. The diagram of state of the Mg-Th system, based on the micro-structural and thermal analyses, is reproduced in Fig.2; the diagram is of the eutectic type. Fig.3 shows reproductions of the micro-structure of Mg-Th alloys for 3 and 20% Th respectively and magnifications of 315 and 1000 times. The obtained results indicate that Mg-Th alloys have a high micro-hardness (306 kg/mm^2) which approaches in value the micro-hardness of Mg_2Ni, $MgNi_2$, etc; the micro-hardness of the eutectic is 118 kg/mm^2, the micro-hardness of the solid solution is 74 kg/mm^2. The effect of hardening of these alloys during heat treatment was investigated in detail on an alloy containing 10% Th. Fig.4 shows the curves of the kinetics of hardening of this alloy in a coordinate system hardness vs. time; the progress of

Influence of Thorium on the Heat Resistance of Magnesium and Some of its Alloys

ageing was investigated for ten hours. However, it was found that in all cases the hardness hardly changed after the first five hours. The highest hardness was obtained as a result of artificial ageing for three hours at 250°C. On the basis of the obtained results heat treatment regimes were selected for comparative investigation of the short duration and long duration hardness at 300°C; the obtained data are entered in Table 3. The hardness of ternary alloys was investigated under conditions similar to those pertaining to the binary alloys of Mg with Th; the results of these investigations as well as the compositions of the investigated alloys are summarised in Table 4. The best results at room temperature were obtained by alloying the Mg-3% Th alloy with Ce; the hardness of this alloy increased continuously with increasing Ce content. Ca and Zn have a positive influence in quantities of 0.5 to 1%. Small additions of Mn and Al lead to some decrease in the hardness and only a further increase of the Mn and Al contents

Influence of Thorium on the Heat Resistance of Magnesium and Some of its Alloys

brings about an increase in the hardness. In Fig.6 the influence is graphed of additions of Al, Ca, Ce, Mn and Zn on the long duration hardness of the Mg-3% Th alloy. An idea of the influence of the various components on the high temperature strength of a Mg-3% Th alloy can be gained from the data of Table 5, which contains a comparison of the short duration and the long duration hardness at 300°C (after stabilisation annealing at this temperature for 100 hours) of the ternary alloys; in addition to the better experimental results of the authors themselves, this table contains data for alloys Mg-Th-Zr and Mg-Th-Zr-Zn, alloys which are most widely publicised in Western literature. These alloys were produced by the authors and tested under conditions similar to those applied to the earlier investigated alloys. It can be seen that the highest hardening of Mg-Th alloys at elevated temperatures is ensured by such elements as Mn and Ce. For these, the highest hardness values were obtained, higher even than those containing zirconium and

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zinc. Engineer I. M. Bavykina and G. M. Bordina participated in the experiments.
There are 6 figures and 5 tables and 3 references, all of which are English.

SUBMITTED: October 8, 1957

1. Heat resistant alloys--Properties 2. Magnesium--Properties 3. Magnesium alloys--Mechanical properties 4. Magnesium alloys --Temperature factors 5. Magnesium alloys--Test results 6. Thorium --Metallurgical effects

Card 5/5

SOV/129-58-11-5/13

AUTHORS: Bochvar, A.A., Academician, Drits, M. Ye., Candidate of Technical Sciences, Sviderskaya, Z. A. and Kadaner, E.S.

TITLE: Influence of the Temperature and of the Preliminary Heat Treatment on the Long Duration Strength of a Cast and Deformed Alloy (Vliyaniye temperatury i predvaritel'noy termicheskoy obrabotki na dlitel'nuyu prochnost' litogo i deformirovannogo splava)

PERIODICAL: Metallovedeniye i Obrabotka Metallov, 1958, Nr 11, pp 32-37 (USSR)

ABSTRACT: The authors investigated the differences in the changes of the high temperature characteristics of a cast and deformed alloy of the system Mg-Mn-Al-Ca containing 1.5% Mn, 0.5% Al, 0.3% Ca and rest Mg (Ref 1). Specimens cast in earthen moulds as well as specimens of the same composition after pressing in the hot state with a deformation of 90% were investigated. The changes were studied of long duration strength on various testing times at elevated temperatures. The long duration strength values determined on the basis of testing five or six specimens for each point are entered in Table 1; the graphs Fig.1 show the change of the long duration

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Influence of the Temperature and of the Preliminary Heat Treatment on the Long Duration Strength of a Cast and Deformed Alloy

strength of the cast (top graph) and the deformed (bottom graph) alloy as a function of the temperature and testing time and it can be seen that there is a considerable difference between the two sets of curves, the cast structure being the more stable one. To establish the magnitude of the possible deviations of the long duration strength of an alloy in the two structural states, the authors investigated the influence of preliminary heating within a wide range of temperatures (150 to 600°C). Up to 450°C the annealing was effected in air using a magnesium oxide cover. Heating to 500 and 600°C was effected in sealed quartz ampules from which the air was evacuated. In both cases the heating time was 24 hours. The results are entered in Table 2. In Fig.2 the dependence is graphed of the long duration strength of the cast and the deformed Mg-Mn-Al-Ca alloy as a function of the preliminary heating temperature for both states. In the case of the structure obtained by casting, high temperature heating intensifies the tendency to creep, whilst in the case of a structure

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Influence of the Temperature and of the Preliminary Heat Treatment on the Long Duration Strength of a Cast and Deformed Alloy

produced by deformation the same heating will bring about an improvement in the heat resistance. The process of recrystallisation, which is effected as a result of displacement of the atoms from one crystal to the other, intensifies the creep of the deformed material if the first stages of this process proceed directly during heat resistance tests. However, if recrystallisation is effected earlier by means of heating at a sufficiently high temperature of the deformed alloy, then the recrystallisation will have a positive influence on the heat resistance due to the creation of a more stable structure and a reduction of the division surfaces which serve as foci of diffusional displacements. There are 4 figures, 2 tables and 4 Soviet references.

ASSOCIATION: Institut metallurgii AN SSSR (Institute of Metallurgy, Ac.Sc., USSR)

1. Alloy castings--Mechanical properties 2. Alloy castings--Heat treatment 3. Alloy castings--Temperature factors 4. Alloys--Deformation

Card 3/3

DRITS, M.Ye.; MASTRYUKOV, A.V.

TSAM 9-1,5 zinc alloy used in bearings. Tekst.prom. 18 no.5:51-53 My '58. (MIRA 11:5)
(Bearing metals) (Zinc alloys)

20-119-2-34/60

AUTHORS: Sviderskaya, Z. A., Drits, M. Ye., Kadaner, E. S.

TITLE: The Micro-Heterogeneity Variation in Alloys Subjected to Heating (Izmeneniye mikroneodnorodnosti splavov pod vliyaniyem nagreva)

PERIODICAL: Doklady Akademii Nauk SSSR, 1958, Vol. 119, Nr 2, pp. 311 - 313 (USSR)

ABSTRACT: S. T. Kishkin and S. Z. Bokshteyn (Reference 1) found that the homogenizing annealing of some alloys with nickel basis increases the inhomogeneity of the distribution of some elements and that it therefore also increases the heterogeneity of the structure of these elements. The authors of the present paper found analogous phenomena in the investigation of the kinetics of the processes of redistribution of the components in the annealing of some light alloys on the basis of aluminium and magnesium. The variations of the micro-homogeneity of the structure of alloys are represented graphically as function of different conditions of annealing. Such

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The Micro-Heterogeneity Variation in Alloys Subjected to Heating

a diagram shows the curves for the variation of the coefficients of the microinhomogeneity of the binary alloys Al-Fe and Al-Ca with increasing duration of annealing at a temperature by 50°C below the solidus line. With both alloys the character of these curves is similar but the variations in the course of the curves occur, however, at a somewhat shorter duration of heating in the case of Al-Ca. A comparatively short arrest at the temperature of annealing reduces the coefficient of the micro-inhomogeneity and thereby balances the structure of the alloys. But with increasing duration of heating either an obvious increase of the degree of inhomogeneity or at least a noticeable tendency to such an increase are observed. The two alloys investigated belong to the binary systems with an almost completely lacking solubility in solid state. Therefore a remarkable amount of the second phase is present in the structure of the alloys in the case of given alloy limits. The here observed results speak in favor of a coincidence between the observed varia-

The Micro-Heterogeneity Variation in Alloys Subjected to Heating

tions of the structure of the alloys and the coefficients of the micro-inhomogeneity. An increase of the micro-inhomogeneity of the structure was found by the author of this paper also in the case of the alloys of magnesium with calcium. A further diagram shows the variation of the coefficients of the micro-inhomogeneity with increasing annealing temperature (duration of annealing was 24 hours) for the alloys Mg-Ca and Mg-Mn-Al-Ca. In both cases the heating of the alloys to 500°C strongly decreases the micro-inhomogeneity in the distribution of calcium, which speaks in favor of a great intensity of the redistribution processes occuring at this temperature. At certain conditions of annealing obviously a socalled " secondary heterogenization" of the structure of the alloys, i.e. an increase of the degree of micro-inhomogeneity can take place. There are 4 figures and 3 Soviet references.

20-119-2-34/60

The Micro-Heterogeneity Variation in Alloys Subjected to Heating

ASSOCIATION: Institut metallurgii im. A. A. Baykova Akademii nauk SSSR (Institute of Metallurgy imeni A. A. Baykov, AS USSR)

PRESENTED: August 7, 1957, by I. P. Bardin, Member, Academy of Sciences, USSR

SUBMITTED: August 6, 1957

Card 4/4

DRITS, M.Ye.; FRIDLYANDER, I.N.; SOFIANO, N.K., red.; SIVKOVA, N.N., tekhn.red.

[Aluminum-base alloys; their applications and prospects of use in the economy] Splavy na osnove aliuminiia; primenenie i perspektivy ispol'zovaniia ikh v narodnom khoziaistve. Moskva, Vses.in-t nauchn.i tekhn.informatsii, 1959. 57 p. (MIRA 13:6)
(Aluminum alloys)

DRITS, M Ye

Splavy na osnove alyuminiya; primeneniye I perspektivy ispol'zovaniya ikh v narodnom khozyaystve [by] M.Ye. Drits [i] I.N. Fridlyander. Moskva, VINITI, 1959.

57 [1] p. Tables.

At head of title: Moscow. Vsesoyuznyy Institut Nauchnoy I Tekhnicheskoy Informatsii and Russia. Gosudarstvennyy Nauchno-Tekhnicheskit Komitet.

Bibliography: p. 57-[58]

DRITS, M. YE.

PHASE I BOOK EXPLOITATION SOV/3688

Akademiya nauk SSSR. Institut mashinovedeniya. Komissiya po tekhnologii mashinostroyeniya. Seminar po kachestvu poverkhnosti

Kachestvo poverkhnosti detaley mashin, sbornik 4. Tekhnologicheskiye faktory obrabotki. Metrologiya i pribory. Ekspluatatsionnyye svoystva poverkhnostnogo sloya (Surface Quality of Machine Parts, Collection of Articles, No. 4: Processing Factors in Machining. Metrology and Instruments. Operational Properties of the Surface Layer) Moscow, Izd-vo AN SSSR, 1959. 291 p. (Series: Its: Trudy) Errata slip inserted. 3,200 copies printed.

Sponsoring Agency: Akademiya nauk SSSR. Institut mashinovedeniya.

Resp. Ed.: P.Ye. D'yachenko, Professor; Ed. of Publishing House: G.B. Gorshkov; Tech. Ed.: T.P. Polenova.

PURPOSE: This collection of articles is intended for technical personnel concerned with the quality of surface finishes of machine parts.

COVERAGE: This collection of articles deals with problems of surface roughness and the effect of surface roughness on the wear and strength of machine parts. Among the topics discussed are the development of international standards for surface roughness, the effect of cutting feeds and cutting-tool vibration on the surface roughness of machined parts, the effect of lay direction on the wear of plane friction surfaces, methods and instruments for measuring surface roughness, and the processing of profilograms of finished surfaces. No personalities are mentioned. References follow several of the articles.

AVAILABLE: Library of Congress

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VK/pw/jb
7-12-60

SOV/180-59-2-24/34

AUTHORS: Drits, M.Ye., Mal'tsev, M.V., and Padezhnova, Ye.M. (Moscow)

TITLE: Investigation of Alloys of the Ternary System Magnesium - Thorium - Manganese (Issledovaniye splavov troynoy sistemy magniy-toriy-marganets)

PERIODICAL: Izvestiya akademii nauk SSSR, Otdeleniye tekhnicheskikh nauk, Metallurgiya i toplivo, 1959, Nr 2, pp 121-123 (+ 1 plate) (USSR)

ABSTRACT: In the work described the magnesium corner of the magnesium-thorium-manganese equilibrium diagram with up to 3% manganese and 9% thorium was investigated. The experimental work was carried out with the participation of G.M. Bordina. Grade Mrl magnesium (99.91% Mg), Mg - Mn (3.66% Mn) and Mg Th (16.72% Th) were used to prepare the alloys by fusion in steel crucibles under a flux layer (40-46% $MgCl_2$, 34.40% KCl, 5-8% $BaCl_2$ and 3-5% CaF_2). The ingots were forged at 450 °C and annealed at 550 °C for 100 hours and cut up. The specimens were sealed in quartz ampoules and subjected to prolonged heating at various temperatures followed by water quenching. Microstructures were determined after

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Investigation of Alloys of the Ternary System Magnesium-Thorium-Manganese

etching with 0.5% nitric acid. Fig 1 shows some microstructures. Fig 2 shows isothermal sections, and Fig 3 polythermal sections for 1% Th and 8% Th. The nature of the phases was further studied with the aid of X-ray structural analysis and local microhardness determinations. Thermal analysis of certain alloys was carried out to determine phase-change temperatures. There are 3 figures and 3 references, 2 of which are Soviet and 1 German.

Card 2/2

SUBMITTED: November 19, 1958

SOV/180-59-3-28/43

AUTHORS: Drits, M.Ye., Mal'tsev, M.V. and Rokhlin, L.L. (Moscow)

TITLE: Investigation of Alloys of the Ternary Magnesium-Manganese-Calcium System

PERIODICAL: Izvestiya Akademii nauk SSSR, Otdeleniye tekhnicheskikh nauk, Metallurgiya i toplivo, 1959, Nr 3, pp 142-144(USSR)

ABSTRACT: The magnesium corner of the ternary diagram was investigated for up to 2% Mn or Ca. The alloys were prepared from 99.91% Mg, and Mg-Ca and Mg-Mn master alloys. They were cast in metal moulds. Samples were homogenised at 480°C for 100 hours. They were then heated to various temperatures for long periods and quenched in water. Typical structures obtained are shown in Fig 1: a is α solid solutions, b is α + β(Mn), c is α + Mg_2Ca, and d is α + Mg_2Ca + β(Mn). Microhardness measurements were taken. Results were Mg_2Ca - 108 kg/mm^2 and Mn - 994 kg/mm^2. Thermal analysis showed that there is a peritectic reaction at 553°C:- liquid + β(Mn) $\rightleftarrows$ α + Mg_2Ca. Isothermal and polythermal sections are given in Fig 2 and 3 respectively. It can be seen that a decrease in temperature results in a decrease in the range of α solid solution and of

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$\alpha + \beta(Mn)$ and $\alpha + Mg_2Ca$ regions. There are 3 figures and 5 references, 2 of which are Soviet, 2 German and 1 English.

SUBMITTED: November 24, 1958

DRITS, M. Ye.

Effect of the microgeometry and microstructure of friction surfaces on their wear resistance. Trudy Sem.po kach.poverkh. no.4:266-273 '59. (MIRA 13:6)
(Surfaces (Technology))

67806

TP. 1210

SOV/180-59-5-23/37

AUTHORS: Drits, M.Ye., Rokhlin, L.L., and Sviderskaya, Z.A. (Moscow)

TITLE: Influence of Deformation in the Cold State on the Properties of Alloys of the System Al-Mg_2Si in the Artificially Aged State

PERIODICAL: Izvestiya Akademii nauk SSSR, Otdeleniye tekhnicheskikh nauk, Metallurgiya i toplivo, 1959, Nr 5, pp 132-135 (USSR)

ABSTRACT: Data are given on the influence of deformation in the cold state on the properties of alloys in the pseudo binary section Al-Mg_2Si for various contents of the intermetallic compound. Alloys of this system age appreciably during hardening. The alloys for the experiments were produced from pure (99.985%) aluminium; silicon, and magnesium were introduced in the form of alloys produced from the same type of aluminium. The specimens used in the mechanical tests were produced by turning from brass rods of 10.5 mm diameter. After hardening and natural ageing for six days, the specimens were work hardened by stretching to obtain 1, 5 and 10% residual deformation. The work-hardened specimens were subjected to artificial ageing at 170 °C for six hours.

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hardness) on alloys containing various quantities of the intermetallic component Mg_2Si, is illustrated by the graph Fig 1. The data obtained indicate that the effect of work hardening is greatest on ageing alloys containing 0.7 to 1.5% Mg_2Si. In alloys containing an excess second phase (2 and 4% Mg_2Si), the effect of work hardening will be less pronounced. For pure aluminium and for low-alloy alloys (0.2% Mg_2Si) the changes in the mechanical properties with increasing deformation in the cold state will be smaller still. However, the changes in the properties of these alloys indicate that the structural changes brought about by the cold deformation process itself are not entirely eliminated during subsequent ageing. Apparently they remain conserved even in ageing alloys which are richer as regards the second phase. The rate of change in the mechanical properties with increasing degree of cold working of alloys which have been hardened by heat treatment indicates that deformation in the cold state also influences the process of subsequent ageing.

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In a table on p 134 the measured electrical resistance is given for one of the alloys of the system, containing 1.5% Mg_2Si, which was subjected to various degrees of cold working and artificial ageing at 170 °C for durations of 0 to 4 hours. It can be seen from these data that with increasing time of artificial ageing, the electrical resistance of preliminarily deformed alloys drops considerably faster than it does for the same alloy in the non-deformed state; the higher the degree of work hardening, the lower were the electric resistance values for a given temperature and duration of ageing. Thus for the artificial ageing conditions selected by the authors (170 °C, six hours) cold working of the hardened alloys brings about an appreciable acceleration of the decomposition of the Mg_2Si solid solution in aluminium. Obviously an increase in the degree of decomposition of the solid solution at the given conditions of ageing is also a factor which brings about an increase in the strength

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characteristics of the alloys and a decrease in their plasticity.
There are 4 figures, 1 table and 8 references, of which 5 are Soviet, 2 are English and 1 is Italian.

SUBMITTED: January 23, 1959

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SVIDERSKAYA, Z.A.; DRITS, M.Ye.; VASHCHENKO, A.A.

Effect of cold deformation on properties of alloys of Al - Cu and Al - Cu - Mg systems in a state of artificial aging. Izv. vys.ucheb.zav.; tsvet.met. 2 no.6:158-160 '59. (MIRA 13:4)

1. Institut metallurgii AN SSSR. i Vsesoyuznyy zaochnyy institut tekstil'noy i legkoy promyshlennosti, kafedra tekhnologii metallov.
(Aluminum alloys)

DRITS, M. YE.

PHASE I BOOK EXPLOITATION SOV/3402

Akademiya nauk SSSR. Institut metallurgii

Issledovaniye splavov tsvetnykh metallov; sbornik 2 (Analysis of Nonferrous Metal Alloys; Collection of Articles, [No.] 2) Moscow, Izd-vo AN SSSR, 1960. 204 p. Errata slip inserted. 2,800 copies printed.

Ed.: I.A. Oding, Corresponding Member, USSR Academy of Sciences; Ed. of Publishing House: V.S. Rzheznikov; Tech. Ed.: T.P. Polenova; Editorial Board: A.A. Bochvar, Academician; M.Ye. Drits, Candidate of Technical Sciences (Deputy Resp. Ed.); M.V. Zakharov, Professor, Doctor of Technical Sciences; E.S. Kadaner, Candidate of Technical Sciences (Resp. Secretary); A.M. Korol'kov, Doctor of Technical Sciences; M.V. Mal'tsev Professor, Doctor of Technical Sciences; and Z.A. Sviderskaya, Candidate of Technical Sciences.

PURPOSE: This collection of articles is intended for workers in scientific research institutes, metal and machine works, for teaching personnel, and for students attending schools of higher education.

COVERAGE: This is the second volume in a series of works on nonferrous and light-metal alloys prepared by the Institut metallurgii imeni A.A. Baykova AN SSSR (Institute of Metallurgy imeni A.A. Baykov of the Academy of Sciences USSR), and the Moskovskiy institut tsvetnykh metallov i zolota imeni M.I. Kalinina (Moscow Institute of Nonferrous Metals and Gold imeni M.I. Kalinin). The problems discussed concern the casting and physical metallurgy of nonferrous alloys. The effect of alloying and deformation on the properties of various alloys, and the problems connected with the study of the casting properties and with the plotting of phase diagrams for nonferrous alloys are discussed. No personalities are mentioned. References accompany most of the articles.

Rizkin, S.T., and G.P. Benediktova. The Behavior of Alloys in Contact With Scaling 19

Drits, M.Ye., Z.A. Sviderskaya, and E.S. Kadaner. The Effect of Silicon on the Properties of the D16 Alloy at Room Temperature and at Elevated Temperatures 24

Drits, M.Ye., Z.A. Sviderskaya, A.A. Vestrbenko, and E.S. Kadaner. Comparative Study of Heat Strength of [illegible] Alloys MA8 and MA9 30

[illegible], and V.V. Luk'yanenko. The Effect of a Repeated Heat Treatment on the Mechanical Properties of D16 Alloy at Room Temperature and Elevated Temperatures 33

Pel'v, [illegible]. The Utilization of Bonds Developing Between Adjoining Metal Surfaces In Pressure Treatment 43

Sviderskaya, Z.A., M.Ye. Drits, A.A. Vestrbenko, and [illegible]. The Effect of Cold Deformation on the Properties of [illegible] Aluminum Alloys Hardened by Heat Treatment 67

[illegible], T.V. [illegible], and [illegible]. The Application of High-Temperature Homogenization in the Extrusion of Large Aluminum-Alloy Shapes 7[illegible]

Sviderskaya, Z.A., and [illegible]. The Effect of Cold Deformation on the Mechanical Properties [illegible] Alloy [illegible] Under Different Conditions of Aging 84

[illegible], G. [illegible], and [illegible]. Recrystallization of [illegible] [illegible]

[illegible], and [illegible]. Nucleation and Growth of [illegible] [illegible]

[illegible]. [illegible] [illegible]

[illegible], and T.A. [illegible]. [illegible] of the Method of Extracting the Solid Phase From an Alloy in Plotting Phase Diagrams [illegible]

Drits, M.Ye., [illegible], and [illegible]. Study of the Alloys [illegible] In the Ternary System [illegible] [illegible]

[illegible], and A.A. [illegible]. Surface Tension of Metals and Alloys [illegible]

DRITS, M. YE.

PHASE I BOOK EXPLOITATION SOV/4558
SOV/16-6-5

Akademiya nauk SSSR. Institut metallurgii

Metallurgiya, metallovedeniye, fiziko-khimicheskiye metody issledovaniya (Physicochemical Research Methods in Metallurgy and Metal Science) Moscow, Izd-vo AN SSSR, 1960. 251 p. (Series: Its: Trudy, vyp. 5) Errata slip inserted. 2,800 copies printed.

Sponsoring Agency: Akademiya nauk SSSR. Institut metallurgii imeni A.A. Baykova.

Resp. Ed.: I.P. Bardin, Academician (Deceased); Ed. of Publishing House: V.A. Klimov; Tech. Ed.: T.P. Polenova.

PURPOSE: This collection of articles is intended for metallurgists and metal researchers.

COVERAGE: The collection contains articles on metallurgy, metal science, and physicochemical research methods. Separate articles discuss the structure and properties of some metals and alloys. The effect of cold treatment and inclusions on the properties of alloys are analyzed, and instruments and

DRITS, M. YE.

PHASE I BOOK EXPLOITATION SOV/4164

Vsesoyuznoye soveshchaniye po splavam redkikh metallov. 1st, Moscow, 1957

Redkiye metally i splavy; trudy... (Rare Metals and Alloys; Transactions of the First All-Union Conference on Rare-Metal Alloys) Moscow, Metallurgizdat, 1960. 438 p. 3,150 copies printed.

Sponsoring Agencies: Akademiya nauk SSSR. Institut metallurgii; USSR Komissiya po redkim metallam pri nauchno-tekhnicheskom komitete.

Ed.: I.N. Shapovalov; Ed. of Publishing House: O.M. Kamayeva; Tech. Ed.: P.G. Islent'yeva.

PURPOSE: This collection of articles is intended for metallurgical engineers, physicists, and workers in the machine-building and radio-engineering industries. It may also be used by students of schools of higher education.

COVERAGE: The collection contains technical papers which were presented and discussed at the First All-Union Conference on Rare-Metal Alloys, held in the Institute of Metallurgy, Academy of Sciences USSR in November 1957. Results of investigations of rare-metal alloys, titanium, and copper-base alloys with additions of rare metals are presented and discussed along with investigations of rhenium, vanadium, niobium, and their alloys. The effect of rare-earth metals on properties of magnesium alloys and steels is analyzed. The uses of rhenium as a dehydrating catalyst, electroplating material, and material suitable for making plugs for automobile electrical systems are discussed. Also, the effect of the addition of certain elements on the properties of heat-resistant steel is examined and alloys with special physical properties (particularly semiconductive alloys) are discussed. No personalities are mentioned. Soviet and non-Soviet references accompany some of the articles.

PART II. TITANIUM, AND COPPER-BASE ALLOYS WITH RARE-METAL ADDITIONS

Rare Metals (Cont.) SOV/4164

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S/180/60/000/01/007/027
E071/E135

AUTHOR: Drits, M.Ye., Mal'tsev, M.V., Rocklin, L.L. and Udalova, O.N. (Moscow)

TITLE: An Investigation of Alloy of the Quarternary System: Magnesium - Manganese - Aluminium - Calcium

PERIODICAL: Izvestiya Akademii nauk SSSR, Otdeleniye tekhnicheskikh nauk, Metallurgiya i toplivo, 1960, Nr 1, pp 59-63 (USSR)

ABSTRACT: Alloys of magnesium with additions of manganese, aluminium and calcium found some industrial application, e.g. MA9 alloy containing 1-1.8% of manganese, 0.4-0.8% of aluminium and 0.08-0.3% of calcium (remaining magnesium), which possesses high mechanical properties at room and elevated temperatures and is resistant to oxidation and corrosion. In order to obtain more information about the nature of this alloy, particularly about its structure and conditions of thermal treatment, the knowledge of the equilibrium diagram of the above quarternary system is necessary. In the present paper the results of studies of some cross-sections of this diagram are described. The alloys for the investigation were smelted in an electric resistance furnace in steel crucibles under flux VI3 (30-40% $MgCl_2$, 25-36% KCl,

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6% $CaCl_2$, 15-20% CaF_2 and 7-10% MgO). As starting materials the following were used: magnesium Mg1 (99.91% Mg), aluminium AV000 (99.98% Al) and alloys Mg-Mn (3.2% Mn) and MgCa (14.5% Ca). Casting of ingots was done in metallic moulds 20 mm in diameter and 115 mm high. Ingots were cut into specimens which were submitted to a corresponding thermal treatment. On the basis of microscopic analysis, isothermal cross-sections for 400 and 300 °C for alloys of the quarternary system, corresponding to a constant manganese content (1.5%) and a number of polythermal cross-sections were constructed (Figs 1 and 2). Some typical microstructures are shown in Fig 3. It was established that the industrial alloy MA9 (mean manganese content 1.5%) at an elevated content of calcium and aluminium can contain, in addition to the main strengthening phase - Mn, a number of other strengthening phases: Mg_2Ca, Al_2Ca and the β-phase. There are 3 figures and 5 references, of which 3 are Soviet and 2 English.

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SUBMITTED: November 25, 1959

SVIDERSKAYA, Z.A., kand.tekhn.nauk; DRITS, M.Ye., kand.tekhn.nauk;
VASHCHENKO, A.A.; ROKHLIN, L.L.

Effect of cold deformation on the properties of certain aluminum alloys hardened by heat treatment. Issl.splav.tsvet. met. no.2:67-71 '60. (MIRA 13:5)
(Aluminum alloys--Cold working)

DRITS, M.Ye., kand.tekhn.nauk; MAL'TSEV, M.Ye.; PADEZHNOVA, Ye.M.; BORDINA, G.M.

Investigating ternary system Mg - Th - Mn alloys. Issl.splav. tsvet.met. no.2:114-121 '60. (MIRA 13:5)
(Magnesium-thorium-manganese alloys)

DRITS, M. Ye.; MAL'TSEV, M.V.; SVIDERSKAYA, Z.A.; PADEZHNOVA, Ye.M.

Magnesium alloys containing thorium. Trudy Inst. met. no.4:74-83 '60. (MIRA 14:5)
(Magnesium-thorium alloys—Testing)

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S/180/60/000/004/018/027
E193/E483

18.1245

AUTHORS: Drits, M.Ye., Sviderskaya, Z.A. and Turkina, N.I. (Moscow)

TITLE: On Softening of Chemical Compounds in Magnesium Alloys at Elevated Temperatures

PERIODICAL: Izvestiya Akademii nauk SSSR, Otdeleniye tekhnicheskikh nauk, Metallurgiya i toplivo, 1960, No.4, pp.111-119

TEXT: The behaviour of alloys at elevated temperatures is determined by the properties of both the solid solution matrix and the second phases (intermetallic compounds, solid solutions or grains of pure metals) as well as by the interaction between the matrix and the dispersed strengthening phases. The object of the investigation, described in the present paper, was to study the effect of time and temperature on the properties of intermetallic compounds, formed in Mg-base alloys, by measuring their micro-hardness at temperatures between 20 and 300°C. In addition to manganese, microhardness of the following compounds was determined: Al_2Ca, MgZn, Mg_5Th, Mg_xNd_y, $Mg_{17}Al_{12}$, Mg_9Cl, Mg_2Ca. At each temperature, two hardness measurements were taken with the load of

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20 g applied for 0.5 and 60 min. The results are reproduced in Table 1. It will be seen that the effect of temperature on hardness is not the same for all the phases studied. The intermetallic compounds $Mg_{17}Al_{12}$, Mg_2Ca and MgZn lose their hardness quite rapidly, the softening effect of heating being most pronounced in the compound formed by magnesium and zinc, whose microhardness is reduced considerably already at 150°C. The difference between the microhardness of the MgZn compound, determined at 150°C, with the load applied for 0.5 and 60 min, amounts to more than 100 kg/mm^2. The temperature dependence of microhardness of the compounds of magnesium with Th, Cl and Nl is represented by the curves with a lower angle of slope. On heating to 200°C the difference between short-term and long-term microhardness of these compounds amounts only to 30 to 40 kg/mm^2, as against the difference of 50 to 70 kg/mm^2 in the case of the $Mg_{17}Al_{12}$ and Mg_2Ca compounds. Microhardness of the Mn grains falls with rising temperature at a rate similar to that observed in the Mg_5Th, Mg_9Cl and Mg_xNl_y compounds, although the

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absolute values of microhardness of Mn are considerably higher. The least affected by the increase in temperature is the Al_2Ca compound. The effect of heating on microhardness of the investigated compounds is shown even more clearly in Table 2, which shows the % reduction in long-term microhardness at room temperature on heating to 150, 200, 250 and 300°C. On the basis of data reproduced in Table 2, it can be concluded that the investigated compounds can be divided into two groups: (1) heat-resistant phases such as the Al_2Ca, Mg_5Th, and Mg_9Cl compounds and the Mn grains which, on heating to temperatures up to 300°C, lose less than 50% of their original hardness and (2) heat-sensitive phases such as the $Mg_{17}Al_{12}$, Mg_2Ca and MgZn compounds whose hardness, on heating to 300°C, is reduced by 70 to 90%. Correlation of the data, obtained in the course of the present investigation, with the known effect of temperature on strength of various Mg-base alloys, leads to the conclusion that the properties of these alloys are, to a great extent, determined by the properties of the second phases present in these alloys.

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The object of the next series of experiments was to compare the properties of the Mg_5Th, Mg_9Ce and $Mg_{17}Al_{12}$ compounds with those of the corresponding solid solutions, i.e. the 10% Al-Mg, 4% Th-Mg, and 1% Ce-Mg alloys, tested after quenching from 420, 590 and 575°C, respectively. The results are reproduced in Fig.2, where microhardness, measured with the load applied for 60 min, is plotted against temperature. It is inferred from these results that the phases, precipitated during decomposition of super-saturated solid solutions or during recrystallization, play an important part in determining the properties of these alloys. In systems in which heat-resistant phases are present, their hardness at high temperatures is considerably higher than that of the solid solution matrix and, consequently, they may display a strengthening effect, even at relatively high temperatures. In systems containing heat-sensitive phases, whose hardness at high temperatures is the same, or nearly the same, as that of the matrix, the presence of these phases brings about no improvement in the creep properties of the alloys. In the final chapter of the paper, an attempt is made to

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correlate the results of the present investigation with other properties of the substances studied, such as their crystal structure, type of the chemical bond and melting point (see Table 3). There are 2 figures, 3 tables and 28 references: 21 Soviet and 7 English.

SUBMITTED: April 11, 1960

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